

# Hyunjoon Kim

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## RESEARCH INTERESTS

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**Big Data Analysis, Graph Database, Graph Query Processing, Graph Neural Networks**

## EDUCATION

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**Seoul National University**, Seoul, Korea *Sep. 2013 - Aug. 2020 (expected)*  
Ph.D. Student in Computer Science and Engineering  
Thesis: Fast Graph Query Processing Algorithms Using Dynamic Programming  
Advisor: Prof. Kunsoo Park  
Overall GPA: 4.05/4.3

**Seoul National University**, Seoul, Korea *Mar. 2009 - Feb. 2013*  
B.S. in Computer Science and Engineering  
Overall GPA: 3.91/4.3 (*Summa Cum Laude*)

## PUBLICATIONS

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**Hyunjoon Kim**, Seunghwan Min, Kunsoo Park, Xuemin Lin, Seok-Hee Hong, and Wook-Shin Han. “IDAR: Fast Supergraph Search Using DAG Integration.” Proceedings of the VLDB Endowment, 13(9):1456-1468, 2020.

**Hyunjoon Kim**, Yunyoung Choi, Kunsoo Park, Xuemin Lin, Seok-Hee Hong, and Wook-Shin Han. “Fast Subgraph Query Processing and Subgraph Matching.” work in progress.

Seongi Hong, Geonmo Gu, **Hyunjoon Kim**, and Kunsoo Park. “Performance Comparison of Adaptive Matching Orders for the Subgraph Isomorphism Problem.” Journal of Korean Institute of Information Scientists and Engineers (KIISE), 26(1):38-43, 2020.

Myoungji Han, **Hyunjoon Kim**, Geonmo Gu, Kunsoo Park, and Wook-Shin Han. “Efficient Subgraph Matching: Harmonizing Dynamic Programming, Adaptive Matching Order, and Failing Set Together.” In Proceedings of the International Conference on Management of Data (ACM SIGMOD), pp. 1429-1446, 2019.

Joong Chae Na, **Hyunjoon Kim**, Seunghwan Min, Heejin Park, Thierry Lecroq, Martine Léonard, Laurent Mouchard, and Kunsoo Park. “FM-index of Alignment with Gaps.” Theoretical Computer Science, 710:148-157, 2018.

Joong Chae Na, **Hyunjoon Kim**, Heejin Park, Thierry Lecroq, Martine Léonard, Laurent Mouchard, and Kunsoo Park. “FM-index of Alignment: A Compressed Index for Similar Strings.” Theoretical Computer Science, 638:159-170, 2016.

Myoungji Han, Jihyuk Lim, Junyoung Choi, **Hyunjoon Kim**, Jeongjoo Seo, Cheol Yu, Sung-Ryul Kim, and Kunsoo Park. “A Malicious Traffic Detection Method Using X-means Clustering.” Journal of Korean Institute of Information Scientists and Engineers (KIISE), 41(9):617-624, 2014.

## PROJECTS

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**Framework of Practical Algorithms for NP-hard Graph Problems** *Apr. 2018 - Present*  
· Designed and implemented efficient graph query processing algorithms

- Outperformed existing algorithms by up to several orders of magnitude.
- Published two top-tier conference papers.

### **Chinese Character Input System**

Oct. 2015 - Sep. 2018

- Developed Chinese characters typing software for Android, and obtained two U.S. patents.

### **Multi-omics Analysis Algorithms and Platforms**

Oct. 2014 - Dec. 2016

- Developed a compressed and searchable index FMA for similar strings.
- Experimented on genome sequences of the 1000 Genomes Project.
- Index size is less than one third of that of an state-of-the-art method while pattern search is faster.

### **Response Technologies against Multiple Device-Channel Attack in Future Complex Computing Environments**

Dec. 2013 - Dec. 2014

- Developed a malicious traffic detection method on DARPA 2000 Dataset and ISOT Botnet Dataset.

## **PATENTS**

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Kunsoo Park, Hyunjoon Kim, and Hyun-Kyung Noh. "Keyboard for typing chinese character." U.S. Patent Application 16/134,734, filed March 21, 2019.

Hyun-Kyung Noh, Kunsoo Park, and Hyunjoon Kim. "Chinese character input apparatus and controlling method thereof." U.S. Patent Application 16/028,832, filed January 10, 2019.

## **RESEARCH EXPERIENCE**

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**Computer Theory and Application Lab.**, Seoul National University  
*Graduate Research Assistant*

Sep. 2013 - Current

**Distributed Computing Systems Lab.**, Seoul National University  
*Research Intern*

Feb. 2013 - Mar. 2013

## **TEACHING EXPERIENCE**

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**Mentor in Samsung Convergence Software Course (SCSC)**

Aug. 2015 - Jun. 2016

- Motivated undergraduate students, and assisted them in reviewing CSE courses.

### **Teaching Assistant**

- 4190.407 Algorithms, Seoul National University

Mar. 2014 - Jun. 2014

- 4190.306 Automata theory, Seoul National University

Sep. 2015 - Dec. 2015

## **HONORS**

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Hyunsong Educational & Cultural Foundation Scholarship

Mar. 2010 - Dec. 2012

Seongnam City Scholarship

Sep. 2009 - Dec. 2009

## **SKILLS**

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**Programming Languages.** C/C++, Python, Java, Matlab, R

**Frameworks/Libraries.** TensorFlow, Android SDK, OpenMP, Hadoop

**Others.** Vim, Latex, Git